associations is therefore without foundation. In fact Smith used the word precisely as other botanists are using it to-day.

Mr. Bather calls the form *ecology* a 'vagary of incorrect spelling' of *œcology*. The shorter spelling was formally recommended in 1893 by the foremost botanical organization in this country, on the general ground that the same considerations which make *economy* preferable to *œconomy* make *ecology* preferable to *œcology*. The recommendation has been followed by practically all writers on botanical subjects in this country and occurs in nearly all of the botanical works of the highest educational and scientific standing in America, (Campbell's recent text-book is the only exception I have noticed), and in most if not all papers now appearing based on original work upon adaptations. Whether under these circumstances the form ecology can be properly described as a vagary of incorrect spelling I leave the reader to judge.

W. F. GANONG.

TO THE EDITOR OF SCIENCE: In spite of the number of letters written with regard to the word ecology, the fact has been overlooked that the Standard Dictionary gives ecology, so spelled, with a cross reference to œcology, and so it is a great mistake to say that the newest spelling is not in the latest dictionary. It seems only just to the Standard Dictionary that this statement should be made.

WALLACE CRAIG.

HULL ZOOLOGICAL LABORATORY.

IN view of the recent discussion as to the tardy recognition of scientific terms by the dictionaries, it may be interesting to note that the word *tropism* which is now so commonly used in the discussion of the origins of motor reactions in organisms does not appear in any of the dictionaries (including the 'Century') that are accessible to me. Neither this term nor the term *ecology* belong to the class of narrow technical terms but would demand general definition on account of their comprehensive connotation. I am not aware of the origin or the exact degree of recentness of the term *tropism;* but my impression is that it has been used sufficiently long to have secured some recognition. Still it must be remembered that the word *appendicitis* was not current enough when the first volume of the 'Century Dictionary' appeared, to warrant its inclusion.

JOSEPH JASTROW.

INDIAN SUMMER.

TO THE EDITOR OF SCIENCE: I wish to call the attention of your readers to the exhaustive articles on the origin of the term Indian summer, which is published in the *Monthly Weather Review* for January and February of this year. Mr. Albert Matthews (145 Beacon Street, Boston, Mass.), the author of this memoir, has spared no labor in collecting the early examples of the use of this term. Its first recorded appearance is in the year 1794 in the journal of Major Ebenezer Denny for October 13, 1794, while at Le Boeuf, a few miles from the present city of Erie, Pa., and there can be no doubt but what the term was in extensive use and well recognized at that time. Since that date numerous explanations have been given by different persons as to the origin and original meaning of the term, but these are of the nature of myths or hypotheses and it is very much to be hoped that we shall yet discover earlier cases and the true history of its introduction. We shall be very glad to hear from any one who can add anything of value to the elaborate paper by Mr. Matthews.

CLEVELAND ABBE.

WEATHER BUREAU,
U. S. DEPARTMENT OF AGRICULTURE.

BOTANICAL NOTES.

NATURE STUDY.

WE have had all sorts of books on 'Nature Study,' and for the most part they have been an abomination with nothing to redeem them, possibly with the exception that the authors 'meant well.' Enthusiastic persons who knew nothing exactly about nature, and still less about children, wrote impossible lessons for the pupils in the schools, and too often the superintendents knowing no more in regard to either, 'adopted' these misbegotten productions, and issued instructions to teachers to dole out so many pages a week to the defense-

less pupils in their charge. What botanist has not seen these books which are filled with gush and nonsense, and nothing more? A few days ago a new book on nature study appeared, and it did not require long examination to show that it is of an entirely different order. It was prepared by Professor Hodge of Clark University, and it is not too much to say that it is by far the best and *sanest* book on this subject that has yet appeared. The inevitable result of such work as the author outlines will be the greater love of nature by the child, and yet we do not find that pupils are urged and admonished to 'be good children, and love nature.' There is absolutely nothing of this kind, yet the book is eloquent in suggestions of the lovableness of plants, and birds, and insects, and all manner of creeping things. The namby-pambyism which the healthy-minded boy so properly hates and despises is wanting, and in place of it are the most suggestive of photographs, and descriptions of things that live, and are waiting to be seen by sharp-eyed children. The book must be seen to be known, but a few of the chapter headings will give some idea of the treatment. 'Children's Animals and Pets,' 'Insects of the Household,' 'Garden Studies, Home and School Gardens,' 'Propagation of Plants,' 'Common Frogs and Salamanders,' 'Our Common Birds,' 'Practical Domestication of our Wild Birds,' 'Elementary Forestry,' 'Flowerless Plants,' are some of the titles. The book will no doubt find its way into many schools, and it should drive out the swarm of worthless volumes that have preceded it.

OUR KNOWLEDGE OF THE FUNGI.

The sixteenth volume of Saccardo's Sylloge Fungorum, which has just made its appearance enables us to judge of the rapidity with which mycologists are describing the species of fungi. The last preceding supplementary volume containing descriptions of added species, appeared in August, 1899, so that but little more than two and a half years have passed, and yet we have here an aggregation of 4,314 descriptions, and an appendix of 539 new species and varieties for which the descriptions are not generally given. These 4,853 additions to previously described species bring the total number in the work as a whole up to 52,157. If we make no allowance for synonyms and descriptions of 'forms' this is the total number of fungi now known. The additions in this volume are divided as follows: Hymenomyceteæ, 886; Gasteromyceteæ, 120; Uredinaceæ, 523; Ustilaginaceæ, 79; Phycomyceteæ, 55; Pyrenomyceteæ, 1,102; Laboulbeniaceæ, 231; Discomyceteæ, 466; Deuteromyceteæ ('Fungi Imperfecti'), 1,367. A general index to all of the volumes, I. to XVI., completes the volume.

PACIFIC SEASIDE BOTANY.

For the past ten years there has been maintained at Pacific Grove, two miles west of Monterey, California, a summer school of investigation, under the name of the Hopkins Seaside Laboratory, in which exceptional opportunities for botanical study have been afforded. The session this year opens June 9, and continues for six weeks and the botanical work is to be under the direction of Dr. A. A. Lawson. In addition to the usual general course in botany, there are courses for advanced students in the marine algæ, cytology, and microtechnique. The well-known richness of the marine flora of this part of the coast renders work in this laboratory especially instructive. There are two two-story buildings capable of accommodating eighty students, which are used for laboratories. As the Laboratory is a branch of the biological departments of Leland Stanford Junior University, the facilities are certain to be complete as to apparatus, libraries, etc.

A thousand miles north of Monterey is another seaside station, at Port Renfrew, Vancouver Island, under the charge of Professor MacMillan, of the University of Minnesota. It was established last year, and a successful session was held. This year the session opens about the middle of July and extends to the 1st of September. Botanical instruction will be given on the Phæophyceæ (MacMillan), Rhodophyceæ (Yendo), Chlorophyceæ and Cyanophyceæ (Tilden). The results of the first session lead us to look for work of a high order at this station. The brown seaweeds (Phæophyceæ) are represented by an un-

usally large number of species, and are very abundant. Certainly the Pacific Coast botanists are to be congratulated upon having two such excellent stations for study and research.

MULTIPLICATION OF SPECIES IN BOTANY.

IT is never safe to 'call a halt' in any department of science, much less in a department in which one is not himself a specialist; yet such non-specialist may be permitted to give his impressions as an interested on-looker from another part of the field. And as it often happens that the soldier in a different part of the field of battle is able to see more clearly what is taking place than those in the thick of the mêlée, so it may be that botanists just a little outside of the work of descriptive systematic botany are able to measure the real value of some of the work now being done. One can hardly take up a botanical journal without finding that some of the common species of plants have been split into two or more forms called 'species' by their authors. That such work must be done is inevitable, but it is incredible that ten to twenty species should have been able to hide themselves in plants which had been critically studied by such masters as Gray, Torrey and Watson. As long as these leaders were found to have confused only two or three species in one the interested on-looker was ready enough to accept the dictum of present-day specialists in single genera, and to admit that the masters had blundered, but when we are asked to believe that Gray and Torrey were totally blind and incapable of seeing or defining the limits of species, it is evident that these later workers are dealing with something of which their predecessors either knew nothing or cared nothing when they were defining species. In 1878 there were catalogued for North America in Watson's Bibliographical Index 14 species and 10 varieties of hawthorns, of the genus *Cratægus*. In 1899 these numbers had risen to 34 species and 11 varieties. To-day we are asked by several botanists to add to this list 225 new species almost entirely from the eastern United States, where three years ago there were not *one tenth as many!*

Of course this brings up the old question of the limits of species. This can not be discussed in a short note, but this is certain, that in the case cited we are asked to give greater values than formerly to observable variations. This is carried to such an extreme that one is compelled to ask whether this change is warranted. Are not these new species merely local variations, or in some instances individual variations? The ornithologists have noticed similar minute variations in birds, although they have not regarded them as specific, but rather varietal, or sub-varietal. Yet there are ornithologists who question the wisdom of requiring that all members of a particular subvariety should have been taken 'under the same blackberry bush.' Are not the botanists who are making so many species open to a similar criticism? If in *Cratægus* we have species with such slight variations, what are we to do with the varieties of the common apple trees? We shudder at the thought of these species-multipliers getting into our orchards. There must be at least a thousand or so good 'species' hidden in *Pirus malus* of Linnæus!

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THE COLLECTED PHYSICAL PAPERS OF HENRY A. ROWLAND.

A VOLUME containing the physical papers of Professor Henry A. Rowland, for twenty-five years professor of physics in the Johns Hopkins University, is now in preparation. It will be issued under the editorial direction of a committee appointed for that purpose, consisting of President Remsen, Professor Welch and Professor Ames. The book will contain Professor Rowland's articles and memoirs on physical subjects, together with his popular writings and addresses, numbering sixty in all. These have been collected from over twenty different magazines and journals. The subjects treated in these papers cover a wide range. In heat there is the great memoir on the mechanical equivalent of heat, with several shorter articles on thermometers. In electricity and magnetism there are the fundamental researches on magnetization, on the magnetic effect of electrical convection, on the value of the ohm, on the theory and use of alterna-